REMARKS

The present application was filed on September 23, 2003 with claims 1-23.

In the outstanding Office Action dated October 31, 2006, the Examiner: (i) rejected claims 7 and 17 under 35 U.S.C. §112, first paragraph; (ii) rejected claims 1, 3, 9-11, 13 and 19-23 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,222,101 to Ariyavisitakul (hereinafter "Ariyavisitakul"); (iii) rejected claims 2 and 12 under 35 U.S.C. §103(a) as being unpatentable over Ariyavisitakul in view of U.S. Patent Publication No. 2004/0062326 to Hsu et al. (hereinafter "Hsu"); (iv) rejected claims 4 and 14 under 35 U.S.C. §103(a) as being unpatentable over Ariyavisitakul in view of U.S. Patent Publication No. 2003/0086339 to Dally et al. (hereinafter "Dally"); (v) rejected claims 5, 6, 8, 15, 16 and 18 under 35 U.S.C. §103(a) as being unpatentable over Ariyavisitakul in view of U.S. Patent Publication No. 2004/0243258 to Shattil (hereinafter "Shattil"); and (vi) rejected claims 7 and 17 under 35 U.S.C. §103(a) as being unpatentable over Ariyavisitakul and Shattil, and further in view of U.S. Patent No. 6,570,944 to Best et al. (hereinafter "Best").

In this response, Applicants amend claims 6 and 16, and respectfully traverse the various rejections for at least the following reasons.

Regarding the objection to claims 6 and 16, Applicants have amended the claims to correct the informality. Accordingly, withdrawal of the objection is respectfully requested.

With regard to the §112, first paragraph rejection of claims 7 and 17, Applicants respectfully disagree. The present specification at page 8, line 25 through page 9, line 11 describes the claims in such a way as to enable one skilled in the art to make and use the same.

The present specification at page 8, line 25 through page 9, line 11 recites the following:

> In accordance with the delay line arrangements, block 610 generates leading edge samples, block 620 generates eye center samples, and block 630 generates trailing edge samples.
>
> More particularly, the three latches of block 610 detect a zero crossing of the input signal, indicating the leading edge of a pulse. The three latches of block 630 again detect a zero crossing of the input signal, indicating the trailing edge of the pulse. Once both the leading and trailing edge of the input pulse has been detected, the three latches of block 620 are used to determine how much amplitude is associated with that pulse. The eye center threshold is varied, and multiple

experiments are performed to determine the range of values that the pulse can have.

For example, if the threshold is set to 100 mV, then a value of '1' on the middle latches, when the leading and trailing latches indicate that a pulse is present, shows that the pulse was larger than 100 mV in amplitude, while a value of '0' shows that the pulse had less than 100 mV in amplitude. By sweeping the value of the threshold from 100 mV to 300 mV, an accurate measure of the height of a typical pulse can be made. Both leading and trailing edges are determined by looking for a '0' to '1' or '1' to '0' transition between consecutive latches in the leading or trailing group.

Accordingly, withdrawal of the §112 rejection is respectfully requested.

With regard to the §102(b) rejection, Applicants initially note that MPEP §2131 specifies that a given claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, MPEP §2131 indicates that the cited reference must show the "identical invention . . . in as complete detail as is contained in the . . . claim," citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Applicants respectfully traverse the §102(b) rejection on the ground that the Ariyavisitakul reference fails to teach or suggest each and every limitation of claims 1, 3, 9-11, 13 and 19-23 as alleged.

Independent claim 1 is directed to a method of equalizing an input signal received from a communications channel, comprising the steps of: generating at least one sampling from the received input signal based on a clock signal unrelated to a clock signal used to recover data associated with the received input signal; and compensating for distortion associated with the communications channel based on at least a portion of the at least one generated sampling.

In an illustrative embodiment of the present invention, equalization system 400 receives an input signal from the data communications channel. The input signal is provided to programmable filter 402 whose filtering characteristics are set by filter parameters. The values for the filter parameters are provided by equalization algorithm 406. The filtering characteristics of filter 402 are adaptively set such that distortion associated with the communications channel is compensated for, i.e., canceled or, at least, substantially canceled. That is, the input signal is modified by

programmable filter 402, based on the filter parameters calculated by equalization algorithm 406, to compensate for channel distortion. Snapshot module 404 samples the output of programmable filter 402, based on a clock (low-frequency sampling clock) that is unrelated to (e.g., independent of) the clock used to recover data, and provides a snapshot of the input signal to equalization algorithm 406 such that the algorithm can adapt the filter parameters, based on the snapshot, so as to compensate for distortion in the input signal caused by the channel. The adaptive loop of sampling the input signal (via snapshot module 404), adjusting the filter parameter values (via equalization algorithm 406) and applying the filtering parameter values (via programmable filter 402) to modify the input signal may continue until distortion in the input signal equals or falls below some maximum acceptable distortion threshold value. Thus, given the particular equalization algorithm and the compensation mechanism (e.g., programmable filter) used, one of ordinary skill in the art will readily realize how the particular equalization algorithm generates the compensation parameters used to equalize the input signal, based on the set of samples (snapshot) generated according to the invention.

The Examiner, in formulating the §102(b) rejection of claim 1, argues that each and every one of the above-noted limitations of claim 1 is anticipated by the teachings of Ariyavisitakul. Applicants respectfully disagree.

In characterizing the Ariyavisitakul reference as allegedly meeting certain limitations of claim 1, the Examiner relies on FIG. 1, column 1, last paragraph, column 10, last paragraph, column 12, lines 21 and 22, and the abstract, lines 3-5.

The Ariyavisitakul reference, at column 12, lines 14-15, teaches the symbol timing to be the same as the optimum sampling time for each symbol. Assuming for the sake of argument, that the symbol timing of Ariyavisitakul is the frequency at which the received input signal generates at least one sampling, and the optimum sampling time is a clock signal used to recover data associated with the received input signal, Ariyavisitakul fails to anticipate the claimed invention since, in Ariyavisitakul, the symbol timing and the optimum sampling time are the same. In contrast, the claimed invention discloses of generating at least one sampling from the received input signal based on a clock signal unrelated to a clock signal used to recover data associated with the received input

signal.

The Examiner points to column 12, lines 21-22 of Ariyavisitakul as teaching the limitation of the clock signal that is the basis of generating at least one sampling being unrelated to a clock signal used to recover data, since Ariyavisitakul refers to transmitter and receiver clocks. However, whether Ariyavisitakul discloses a different transmitter clock from the receiver clock is irrelevant to the claim rejection. It is the receiver clock that is used to perform data recovery, not the transmitter clock. And as such, it is clear that Ariyavisitakul discloses that sampling is done using a clock related to the data recovery clock. Thus, Ariyavisitakul fails to anticipate the recited limitation.

Accordingly, withdrawal of the §102(b) rejection of claim 1 is respectfully requested.

Independent claims 11 and 21 include limitations similar to those of claim 1, and are therefore believed allowable for reasons similar to those described above with reference to claim 1.

Dependent claims 3, 9, 10, 13, 19, 20, 22 and 23 are allowable for at least the reasons identified above with regard to claims 1, 11 and 21. One or more of these claims are also believed to define separately-patentable subject matter over the cited art. Accordingly, withdrawal of the §102(b) rejection of claims 1, 3, 9-11, 13 and 19-23 is respectfully requested.

With regard to the §103(a) rejection of claims 2, 4-8, 12 and 14-18, Applicants assert that the Hsu, Dally, Shattil and Best references fail to remedy the deficiencies described above with regard to Ariyavisitakul. Thus, claims 2, 4-8, 12 and 14-18 are patentable at least by virtue of their dependency from claims 1, 11 and 21. Claims 2, 4-8, 12 and 14-18 also recite patentable subject matter in their own right. Accordingly, withdrawal of the §103(a) rejection of claims 2, 4-8, 12 and 14-18 is respectfully requested.

In view of the above, Applicants believe that claims 1-23 are in condition for allowance, and respectfully request withdrawal of the §112, §102(b) and §103(a) rejections.

Respectfully submitted,

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